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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-------------------------|------------------|
| 10/709,420 | 05/04/2004 | Youssef Hamidieh | 81098863 / FMC 1747 PUS | 3419 |

28395 7590 11/25/2005
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| EXAMINER |
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CHAPMAN JR, JOHN E

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| ART UNIT | PAPER NUMBER |
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2856

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|-------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/709,420 | Applicant(s) HAMIDIEH ET AL. | |
| | Examiner John E. Chapman | Art Unit 2856 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-15 is/are allowed.
- 6) ☒ Claim(s) 1,4-8 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/4/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16-18 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Pomernacki (4,252,023).

Pomernacki discloses a checking system for detecting anomalies in a moveable component (gear 10 or 12), comprising an actuator 40 to operate (rotate) the component at a predetermined speed (col. 2, line 9); a structure (42) for supporting the component (gear 12) while the component is being rotated, the structure having a modal frequency (i.e., resonant frequency) approximately the same as the anomaly (tooth-to-tooth) frequency (col. 2, lines 8-13), and a sensor (68) for measuring values of a response parameter (acceleration).

While claim 16 recites that the checking system anomaly frequency should be different from the assembly anomaly frequency, such limitation reflects the intended use of the component and fails to structurally distinguish the apparatus. Whether the anomaly frequency of the gear

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(10 or 12) when subsequently installed in an assembly is greater or less than the anomaly frequency in the checking system does not affect the structure of the checking system. The checking system of Pomernacki is inherently capable of detecting anomalies in gears that are subsequently operated in an assembly at speeds that are different from that in the gear checking system. Furthermore, it would have been obvious to detect anomalies in gears that are subsequently operated in an assembly at speeds that are different from that in the gear checking system, for example, in an assembly that is operated at a plurality of speeds.

Regarding the limitation that the checking system have “at least one modal frequency within a predetermined frequency range of the checking system including the at least one checking system anomaly frequency,” since the anomaly (tooth-to-tooth) frequency is substantially the same as the modal (resonant) frequency, it is necessarily within a small frequency range of the modal frequency.

Regarding claim 17, the brake 32 comprises a second actuator operable to apply a load to the component (gear 10 or 12).

4. Claims 1, 4-8, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pomernacki.

Regarding claim 1, Pomernacki discloses a method for detecting anomalies in a component (gear 10 or 12) prior to the component being installed in an assembly, wherein a component checking system is configured to operate at a predetermined speed (that of drive motor 40), an anomaly (tooth-to-tooth) frequency is determined from the predetermined speed, and a portion of the checking system (springs 42) is configured to have a modal frequency

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(resonant frequency) within a small range of anomaly (tooth-to-tooth) frequency. See column 2, lines 8-13. The component (gear 10 or 12) is operated in the checking system and a response parameter (vibration) is measured while the component is being operated in the checking system. Accordingly, the only difference between the claimed invention and the prior art consists in discrimination for the component by comparing an amplitude response of the checking system using a component having at least one anomaly and an amplitude response of the checking system using a component having substantially no anomalies. It is well known in the art to measure the amplitude response of a defective component, and the amplitude response of a normal component, and then compare the amplitude response of a test component with those of the defective and normal components in order to determine whether the test component is defective or normal. Accordingly, it would have been obvious to compare the amplitude of the output of accelerometer 68 for a test gear with those of a normal gear and a defective gear in order to determine whether the test gear is normal or defective.

Regarding claim 4, it would have been obvious to set a threshold value indicating a defective gear.

Regarding claim 7, it is well known in the art to transform measured values from a time domain to a frequency domain in order to determine the amplitude of a particular frequency component. Accordingly, it would have been obvious to transform measured values from a time domain to a frequency domain in order to determine the amplitude of vibration components at the tooth-to-tooth frequency.

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Regarding claim 19, Pomernacki does not discuss the type of gears being noise tested. Nevertheless, it would have been obvious to use the apparatus of Pomernacki to noise test a variety of gears, including a vehicle transmission gears.

Regarding claim 20, Fig. 3 shows single flank contact.

5. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

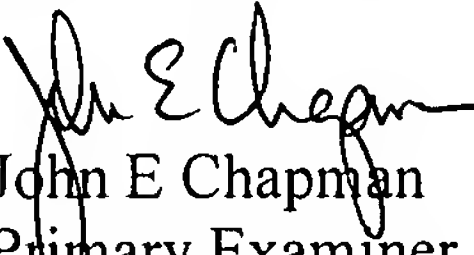
6. Claims 9-15 are allowed.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hernandez et al. discloses a method and apparatus for detecting gear defects comprising an accelerometer 16. Choi et al. discloses a noise measuring device for a differential gear assembly comprising a sound level meter 30 and a frequency analyzer 31.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John E. Chapman whose telephone number is (571) 272-2191. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John E Chapman
Primary Examiner
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